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Form Approved
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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED FINAL REPORT 01 Apr 96 - 31 Mar 97
4. TITLE AND SUBTITLE (JSEP) Research in Electronics		5. FUNDING NUMBERS 61102F 2301/FS
6. AUTHOR(S) Professor Steier		AFOSR-TR-97 0 308
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Electronic Sciences Laboratory University of Southern California Los Angeles, CA 90089-0483		10. SPONSORING/MONITORING AGENCY REPORT NUMBER F49620-94-C-0022
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) AFOSR/NE 110 Duncan Avenue Suite B115 Bolling AFB DC 20332-8050		
11. SUPPLEMENTARY NOTES		12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED
12b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) During the first two years of this period ten research projects were supported and during the final year nine units were supported under this program. The units are in the areas of Solid State Electronics, Optical and Infrared Electronics, and Information Electronics. The three year period has been a very productive one from the scientific results achieved and the transfer of the results to industry and government laboratories. The results are documented in the 63 scientific publications and one book chapter that have resulted from this research. Perhaps the best mode of technology transfer is through students who graduate and carry the technology with them to other laboratories and industry. Fourteen students who were supported by JSEP received Ph.D. degrees during this period.		
14. SUBJECT TERMS		15. NUMBER OF PAGES
DTIC QUALITY INSPECTED 4		16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED
20. LIMITATION OF ABSTRACT		

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UNIVERSITY OF SOUTHERN CALIFORNIA
SCHOOL OF ENGINEERING / ELECTROPHYSICS

**JOINT SERVICES ELECTRONICS PROGRAM
RESEARCH IN ELECTRONICS**

CONTRACT NO. F49620-94-C-0022

FINAL REPORT

4/1/94 through 3/31/97

Presented to:

**The Air Force Office of Scientific Research
110 Duncan Avenue, Suite B115
Bolling Air Force Base, DC 20332-0001**

Presented by:

**University of Southern California
Electronic Sciences Laboratory
LOS ANGELES, CALIFORNIA 90089-0483**

19971002 096



**UNIVERSITY
OF SOUTHERN
CALIFORNIA**

Joint Services Electronics Program

OVERVIEW

This final report on the Joint Services Electronics Program, Contract F49620-94-C-002, covers the three year period 4/1/94 through 3/31/97.

During the first two years of this period ten research projects were supported and during the final year nine units were supported under this program. The units are in the areas of Solid State Electronics, Optical and Infrared Electronics, and Information Electronics. The three year period has been a very productive one from the scientific results achieved and the transfer of the results to industry and government laboratories. The results are documented in the 63 scientific publications and one book chapter that have resulted from this research. Perhaps the best mode of technology transfer is through students who graduate and carry the technology with them to other laboratories and industry. Fourteen students who were supported by JSEP received Ph.D. degrees during this period.

Solid State Electronics

SS2-1 P. D. Dapkus

**Low Temperature H-Free Growth of AlGaN
Materials by Vacuum Atomic Layer Epitaxy**

SS2-2 A. Madhukar

**Innovative Approaches For Processing of Advanced
Semiconductor Structures and Integration of
Diffractive Optical Elements for Packaging**

SS2-3 R. Nottenburg

High Speed Interface Electronics for Optoelectronics

Optical and Infrared Electronics

OE2-1 J. Feinberg

**Waveguides and Frequency Doubling in Ferroelectric
Crystals**

OE2-2 E. Garmire

**Understanding the Dynamics of Charge Transport in
Quantum Well Structures for Improved Device
Performance**

OE2-3 W. Steier

Integrated Organic Semiconductor Opto-Electronics

OE2-4 A. Levi

**Influence of Reduced Size on the Performance of
Semiconductor Micro-Lasers**

OE2-5 A. Sawchuk

**Integration of Diffractive Optics with Smart Pixels for
Optical Communications, Networking and Computing**

Information Electronics

IE2-1 R. Scholtz

**Wideband Time-Hopping for Multiple-Access
Communications**

IE2-2 A. Polydoros

Inference and Sorting of Wideband Signals

DEGREES AWARDED

Aydin, Levent	PhD	1996
Panagiotou, Prokopias	PhD	1997
Kalburge, Amol	PhD	1997
Konkor, Atul	PhD	1997
Kunzia, Charles	PhD	1994
Lin, Jeng-Feng	PhD	1996
De La Cruz, San Ching	PhD	1997
Noraev, Dmitry	PhD	1996
Kalluri, Shrinath	PhD	1997
Ranon, Peter	PhD	1993
Kanjamala, Ashok	PhD	1997
Thiyagarajan, S.	PhD	1997
Win, Moe	PhD	1997
Lao, Lihui	MS	1996

JOINT SERVICES ELECTRONICS PROGRAM

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56. "Considerations for Optoelectronic Shared Cache Parallel Computers," L. Cheng and A.A. Sawchuk, Proc. of First International Workshop on Massively Parallel Processing Using Optical Interconnections (MPPOI '94), April 26-27, 1994, IEEE Computer Society Press, Los Alamitos, CA.

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Book Chapters.

1. "Nonequilibrium electron transport in heterojunction bipolar transistors," A. F. J. Levi, InP HBTs: Growth, Processing and Applications, eds. B. Jalali and S. J. Pearton, ISBN#0-89006-724-4 (Artech House, Norwood, MA, pp. 89-131, 1995).